

## **College of Education**

### **Department of Science and Technology Education**

### **Research focus areas for 2027**

**RESEARCH OPPORTUNITIES, AVAILABLE SUPERVISION CAPACITY AND SELECTION CRITERIA, ADMISSION AND REGISTRATION INFORMATION PER SCHOOL AND DEPARTMENT IN CEDU**

- Physical science education
- Life science education
- Natural science education
- Geography education
- Environmental education
- Technology and entrepreneurship
- Technology education
- ICT in education
- Indigenous knowledge systems
- Inquiry-based instructions
- Pedagogical content knowledge
- Practical work in science
- Rural education
- Mentoring of novice science teachers
- Language and science teaching and learning
- Teacher thinking/belief/conception
- Physics and chemistry education
- IBL in the senior phase

**Research projects that postgraduate students can participate in**

#### **Models of supervision**

The individual and co-supervision models are used. Co-supervision is mostly done for mentoring purposes and multi, inter and trans-disciplinary (MIT) research. Some supervisors in the College supervise across departments. Students are therefore advised to study the lecturer profiles of other departments in the College when trying to identify a suitable supervisor.

#### **Opportunities regarding external supervision**

External supervisors may be considered if a suitable supervisor is not available in the Department. However, this will depend on the financial viability of the Department.

### Contact details of the department

Prof P Blose: Nkoana Simon Radipere Building, 7-15; tel: 012 429 2234 e-mail: [eblosep@unisa.ac.za](mailto:eblosep@unisa.ac.za) (Acting COD)

Research projects that postgraduate students can participate in

| Name of project                                                                                  | Brief description of the project                                                                                                                                                                                                                                                               | Project leader  | No of available positions for MEd students for 2027 | No of available positions for PhD students for 2027 |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------|-----------------------------------------------------|
| Developing Teachers' Futures for Climate Action: Climate Change Education                        | The project supports master's and doctoral students in conducting research that advances climate change education and explores how these M&D students can provide ongoing guidance to teachers across different subjects.                                                                      | Prof SB Msezane | 10                                                  | 5                                                   |
| TPACK community engagement project                                                               | Assisting teachers in using educational technology to deliver content.                                                                                                                                                                                                                         | Prof Molotsi    |                                                     | 3                                                   |
| Integrating Indigenous Knowledge in Tech Education: A Study of South African Higher Institutions | to compare how South African institutions incorporate Indigenous Knowledge Systems (IKS) into Education for Sustainable Development (ESD) in Technology Education, identify best practices, and evaluate the effectiveness of their courses in promoting sustainability from IKS perspectives. | Prof Blose      | 2                                                   | 2                                                   |

### Focused M & D programmes

| Name of programme                                                                                          | Qualification code | Course work/full research                                |
|------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------|
| Master of Education in Natural Science Education (One of the new streams: Agricultural Sciences Education) | 98448              | Research proposal module plus full research dissertation |

|                                                                                                                                                                                                      |       |                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------|
| Master of Education in Environmental Education                                                                                                                                                       | 98428 | Research proposal module plus full research dissertation |
| PhD in Education (Streams: Natural Science Education (NSE); Environmental Education (ENE); Technology in Education (TED); ICT in Education/ Educational Technology, Agricultural Sciences Education) | 90019 | Research proposal module plus full research thesis       |

#### Details of individual supervisors and their research interests or fields of expertise

| Name of supervisor | Research interest/field of expertise                                                                                                                                                                                                                                     | No of positions for MEd students still available for 2027 | No of positions for PhD students still available for 2027 |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------|
| Prof P Blose       | <ul style="list-style-type: none"> <li>Technology Education</li> <li>Education for Sustainable Development</li> <li>Indigenous knowledge systems</li> </ul>                                                                                                              | 2                                                         | 2                                                         |
| Ms J Broadhurst    | <ul style="list-style-type: none"> <li>Life science education</li> <li>Natural science education</li> <li>Digitization of Science Education</li> </ul>                                                                                                                   | 0                                                         | 0                                                         |
| Prof L Goosen      | <ul style="list-style-type: none"> <li>ICT in education</li> </ul>                                                                                                                                                                                                       | 0                                                         | 0                                                         |
| Prof MT Gumbo      | <ul style="list-style-type: none"> <li>Technology teachers' professional development in pedagogical content knowledge</li> <li>Indigenous knowledge systems</li> <li>Decolonisation of the curriculum</li> <li>Distance education and e-learning</li> </ul>              | 0                                                         | 0                                                         |
| Prof H Hebe        | <ul style="list-style-type: none"> <li>Environmental education/education for sustainable development</li> <li>Teaching and learning of science in early childhood education</li> <li>The position of EE in the school curriculum</li> <li>Geography education</li> </ul> | 2                                                         | 2                                                         |
| Prof LDM Lebeloane | <ul style="list-style-type: none"> <li>Curriculum studies (decolonizing school curriculum, Environmental Education)</li> <li>Environmental management in schools</li> <li>Educational leadership and management</li> </ul>                                               | 0                                                         | 0                                                         |

|                     |                                                                                                                                                                                                                                                                                                                                   |   |   |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
|                     | <ul style="list-style-type: none"> <li>• Comparative Education (multicultural education)</li> <li>• History of Education</li> </ul>                                                                                                                                                                                               |   |   |
| Prof MV Makokotlela | <ul style="list-style-type: none"> <li>• Environmental education/education for sustainable development</li> <li>• Indigenous knowledge</li> <li>• OER</li> </ul>                                                                                                                                                                  | 0 | 0 |
| Prof TA Mapotse     | <ul style="list-style-type: none"> <li>• Technology and environment education</li> <li>• Pedagogic content knowledge in TE</li> <li>• Mentoring of novice TE teachers through action research methodologies</li> <li>• TE teacher thinking/belief/conception around TVET</li> <li>• Indigenous knowledge systems in TE</li> </ul> | 3 | 4 |
| Prof SB Msezane     | <ul style="list-style-type: none"> <li>• Agricultural Sciences Education</li> <li>• Environmental Education</li> </ul>                                                                                                                                                                                                            | 0 | 0 |
| Dr NP Netshivhumbe  | <ul style="list-style-type: none"> <li>• Natural science education</li> <li>• Language and science teaching and learning</li> <li>• Physical science education</li> </ul>                                                                                                                                                         | 2 | 0 |
| Prof EO Mashile     | <ul style="list-style-type: none"> <li>• ICT in Education</li> <li>• Educational Technology</li> <li>• Open Distance eLearning</li> <li>• Physical Science Education</li> <li>• Learning Analytics</li> </ul>                                                                                                                     | 4 | 2 |
| Prof EN Mazibe      | <ul style="list-style-type: none"> <li>• Science education.</li> <li>• Pedagogical content knowledge.</li> <li>• Science teaching and learning materials: document analysis.</li> <li>• Simulations in science education</li> </ul>                                                                                               | 4 | 2 |
| Dr MM McKnight      | <ul style="list-style-type: none"> <li>• Teaching and learning of Natural Science and Life science</li> </ul>                                                                                                                                                                                                                     | 2 | 1 |
| Prof HO Mokiwa      | <ul style="list-style-type: none"> <li>• STEM education</li> <li>• Language in science education</li> <li>• Curriculum development of science</li> </ul>                                                                                                                                                                          | 3 | 4 |
| Prof AR Molotsi     | <ul style="list-style-type: none"> <li>• ICT in education</li> <li>• ODL</li> <li>• Educational technology</li> <li>• ODeL</li> <li>• Education management and leadership</li> <li>• Technological, pedagogical and content knowledge (TPACK)</li> <li>• OER</li> </ul>                                                           | 0 | 3 |

|                    |                                                                                                                                                                                                                                                                            |   |   |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
| Prof AT Motlhabane | <ul style="list-style-type: none"> <li>• Science education</li> <li>• Physical science education</li> <li>• Natural science education</li> <li>• Physics and chemistry education</li> </ul>                                                                                | 2 | 5 |
| Prof AV Mudau      | <ul style="list-style-type: none"> <li>• Teaching and learning of physical science</li> <li>• Teaching and learning of natural sciences</li> <li>• Development and application of scientific language register in African languages for the teaching of science</li> </ul> | 0 | 5 |
| Dr KR Munasi       | <ul style="list-style-type: none"> <li>• Environmental Education/ Education for Sustainable development</li> <li>• Life Sciences Education</li> <li>• Natural Science Education</li> </ul>                                                                                 | 0 | 2 |
| Dr EC Ndlovu       | <ul style="list-style-type: none"> <li>• Technology education</li> <li>• Indigenous knowledge systems</li> <li>• Pedagogic content knowledge</li> <li>• Natural science and technology</li> <li>• Curriculum issues</li> <li>• ODeL</li> </ul>                             | 3 | 2 |
| Prof TG Ntuli      | <ul style="list-style-type: none"> <li>• Natural Science Education</li> <li>• Physical Sciences Education</li> <li>• Language and science teaching and learning</li> </ul>                                                                                                 | 0 | 2 |
| Prof P Photo       | <ul style="list-style-type: none"> <li>• Life science education</li> <li>• Natural science education</li> <li>• Informal learning environment</li> <li>• Practical work in science</li> <li>• IKS</li> <li>• Virtual Reality</li> </ul>                                    | 1 | 2 |
| Mr CA Raseale      | <ul style="list-style-type: none"> <li>• ICT in education</li> <li>• Computer-integrated learning</li> </ul>                                                                                                                                                               | 0 | 0 |
| Prof MZ Sedio      | <ul style="list-style-type: none"> <li>• Technology education</li> </ul>                                                                                                                                                                                                   |   |   |
| Ms MV Chuene       | <ul style="list-style-type: none"> <li>• ICT in education</li> <li>• Natural Science Education</li> <li>• Physical Sciences Education</li> </ul>                                                                                                                           | 4 | 0 |
| Mr L Masuvhe       | <ul style="list-style-type: none"> <li>• Natural Science Education</li> <li>• Indigenous Knowledge Systems</li> </ul>                                                                                                                                                      | 2 | 0 |
| Mr S Mampa         | <ul style="list-style-type: none"> <li>• ICT in education</li> <li>• ODL</li> <li>• Educational technology</li> <li>• ODeL</li> </ul>                                                                                                                                      | 2 | 0 |
| Dr NP Shabalala    | <ul style="list-style-type: none"> <li>• Environmental Education</li> <li>• Climate Change Education</li> </ul>                                                                                                                                                            | 2 | 2 |

|                       |                                                                                                                                                                                                                                                  |   |   |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
|                       | <ul style="list-style-type: none"> <li>• Education for Sustainable Development</li> <li>• Natural Science Education</li> <li>• Life Science Education</li> <li>• Global Citizenship Education</li> <li>• Indigenous Knowledge Systems</li> </ul> |   |   |
| Prof Lettah Sikhosana | <ul style="list-style-type: none"> <li>• Environmental education</li> <li>• Education for Sustainable Development</li> <li>• Climate Change Education</li> <li>• Natural Science education</li> </ul>                                            | 2 | 2 |
| Ms HM Ngakane         | <ul style="list-style-type: none"> <li>• Technology Education</li> </ul>                                                                                                                                                                         | 3 | 0 |

## **Minimum admission requirements for master's and doctoral studies in the College of Education**

### **Master's of Education**

An appropriate Bachelor of Education honours degree, or a postgraduate diploma, or a 480 credit Bachelor of Education Degree with a minimum of 96 credits at NQF level 8 in Mathematics Education. The average mark obtained for the degree shall be 60%. All students should have completed a module in research methods and methodologies as part of their previous level 8 qualification. Students who do not meet these requirements may follow an alternative pathway (e.g. RPL, submitting a portfolio or working through a prescribed reading list – refer to Possible alternative pathways). The application should accord with the various research focus areas/areas of specialisation of the Department, the Department's capacity to provide expert supervision and the requisite qualifications listed above.

### **Doctor of Philosophy (PhD) in Education**

An appropriate Master's of Education in Science Education or Environmental Education is required. The average mark obtained for the degree shall be 60%. Students who do not meet this requirement may follow an alternative pathway (e.g. RPL or submit a portfolio – refer to **Possible alternative pathways**). The application should accord with the various research focus areas/areas of specialisation of the Department, the Department's capacity to provide expert supervision and the requisite qualification listed above.

### **Supporting documentation to be submitted with application**

#### **For a master's degree:**

All relevant documentation as specified by the Department for Master's and Doctoral Administration Support.

Students should submit a short research outline of 600 to 750 words which sketches the intended research project, the research approach, problem statement, short literature review and a working title. In addition, a list of five scholarly articles and two books that have been consulted to compile the research outline should be provided. These sources should be predominantly recent, with the exception of (classical) theories which can only be found in old sources. The Harvard referencing method should be used. Students should provide a declaration that they have consulted the relevant department's website prior to submitting their application and should propose the name of his/her preferred supervisor. Any form of plagiarism in the research outline is unacceptable.

### **For a doctorate degree:**

All relevant documentation as specified by the Department for Master's and Doctoral Administration Support.

Students should submit a short research outline of 800 to 900 words which sketches the intended research project, problem statement, the research approach, a short literature review and a working title for the project. In addition, a list of ten scholarly articles and four books that have been consulted to compile the research outline should be provided. These sources should be predominantly recent, with the exception of (classical) theories which can only be found in old sources. The Harvard referencing method should be used. Students should provide a declaration that they have consulted the relevant department's website prior to submitting their application and should propose the name of his/her preferred supervisor. Please note that any form of plagiarism in the research outline is unacceptable.

**PLEASE NOTE: Students must clearly indicate in their research outline whether they are planning to focus on Natural Science Education or Environmental Education in their PhD. It is therefore imperative that the first heading of the research outline should read: *PhD in Education focusing on Natural Science Education OR on Environmental Education*.**

### **Selection procedures followed in the selection of candidates for postgraduate studies**

All applications will be considered simultaneously by the Departmental Higher Degrees Committee, the chair of the Department, the director of the School and the head of the Office of Graduate Studies and Research for purposes of fairness and transparency. Only candidates who meet the minimum eligibility criteria will be considered.

The Department's supervision capacity and availability of external supervisors will be the first and most important selection criterion. No applicant will be admitted without a supervisor being allocated to the student. If a student requests to be supervised by a particular supervisor, but the supervisor is not available because of his/her existing supervision load, it is the Department's prerogative to allocate an alternative supervisor (internal or external). Further selection will be done based on the following selection criteria (the weight attached to each criteria is indicated between brackets as a percentage of the overall evaluation): the student's academic record and experience in research (30%); understanding of research methods as displayed in the research outline (30%); academic writing skills (30%); and addressing of past inequalities by taking race, gender and disability status into consideration (10%).

The Department will keep record of all the applications and reasons must be provided for unsuccessful applications.

### **Possible alternative pathways**

The following alternative pathways exist for applicants who do not meet the admission requirements:

- Applicants with degrees that have different structures from normal South African honours or master's degrees, applicants whose degrees do not clearly correspond to the Departments admission requirements (e.g. no mark awarded for previous dissertations, no clear evidence of having completed a research-related module as part of the previous qualification, etc.), or applicants who do not meet the admission requirements but who possess applicable experience in research or working experience relevant to the field of interest, that may qualify

them for admission to a master's or doctoral degree will be required to apply for recognition of prior learning (RPL). Prior academic and research activities by the applicant will be evaluated in accordance with formal Unisa RPL procedures and the outcome of the RPL process will be submitted to and approved by the chair of the Department. If the approved outcome of the RPL process is positive, the applicant will be allowed to proceed with an application for admission, subject to all terms and conditions governing the admission process.

- Applicants who apply for a master's degree on the strength of a postgraduate diploma or a 480 credit bachelor's degree with a minimum of 96 credits at level 8 and who have not completed a module in research methodology, will be required to obtain knowledge about research methods and methodology by working through a prescribed reading list which will be forwarded to them by the chair of the Departmental Higher Degrees committee upon request from the student. The student will have to complete and pass a number of assignments related to research methodology. The student may reapply in subsequent years.
- Applicants who do not meet the minimum requirement of 60%, may apply for an alternative pathway by submitting a portfolio containing a motivation letter indicating reasons for wanting to do the qualification and for selecting the specific area he/she is applying for, a CV highlighting experience relevant to the field of interest and evidence of engagement with research which could include one or more of the following: a written report of a scholarly nature, a literature survey, a paper presented at a conference, a published article.

The following alternative pathways exist for applicants whose applications were unsuccessful:

- Students who have been refused admission because of limited capacity within the Department or because their topic was not viable may reapply in subsequent years. It should be clearly indicated that it is a reapplication. The normal selection process will apply in case of reapplications.
- Students who were unsuccessful because of an inadequate research outline, may revise their research outline and may reapply in subsequent years.
- A student whose application was unsuccessful because of inadequate academic writing skills, may reapply in subsequent years provided that he/she can provide proof of measures put in place to improve his/her academic writing skills (e.g. enrolled for and passed a course in academic writing skills).

### **Application procedures and when to apply**

The Department of Science and Technology Education will not make use of differentiated registration dates. Applications for admission and registration will take place in accordance with the dates set by the Department for Master's and Doctoral Administration Support for bulk applications and registrations.

Students should

- apply for a student number, following the steps outlined in <https://www.unisa.ac.za/sites/corporate/default/Apply-for-admission/Master%27s-&-doctoral-degrees/Apply-for-a-student-number-and-apply-for-admission>
- apply for a space in one of the focus areas using the online application process

Once acceptance in the research focus area and the allocation of a supervisor have been confirmed, they may register for the research proposal module